REMARKS

Claims 16-19 are added as new claims. Support for new claim 16 is found, for example, at page 1, lines 15-18 of the original specification. Support for new claim 17 is found, for example, at page 11, lines 25-29 of the original specification. Support for new claims 18 and 19 is found, for example, at page 10 line 19 to page 11, line 2 and page 13, lines 3-5.

No new matter is presented.

Upon entry of the Amendment, claims 1-19 will be all of the claims pending in the application.

I. Response to Claim Rejections under 35 U.S.C. § 102

A. Koji

Claims 1, 2, 4-7, 9-12, 14 and 15 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by JP 07-304620 ("Koji").

Technical difference between this invention and Koji

Applicants respectfully traverse the rejection and submit that Koji does not disclose all elements of the present claims and therefore does not anticipate the present invention.

The present invention relates to an antimicrobial composition comprising tetravalent metal phosphate-based antimicrobial particles represented by Formula (1) and inorganic compound particles having a Mohs hardness of equal to or less than 6. The maximum particle size of these particles is substantially equal to or less than 10 μm.

Koji does not disclose, teach nor suggest the antimicrobial composition comprising inorganic compound particles having a Mohs hardness of equal to or less than 6 of the present invention. Further, Koji does not disclose, teach nor suggest the preferred maximum particle size of the antimicrobial agent and metal oxide (e.g., titanium dioxide).

More specifically, Koji discloses a composition comprising a zirconium phosphate antimicrobial agent and titanium dioxide (Example 4 of Koji, paragraph [00441), but Koji does not disclose, teach nor suggest the preferred maximum particle size of the antimicrobial agent and metal oxide (e.g., titanium dioxide). Koji only discloses that the preferred average particle size of the metal oxide is equal to or less than 10 μm.

Although the Examiner pointed out that Koji discloses a calcium phosphate salt system antimicrobial agent having a particle diameter of 1.2 μm, the calcium phosphate salt system antimicrobial agent is not within the tetravalent metal phosphate-based antimicrobial agent of the present invention. Accordingly, Koji does not disclose, teach nor suggest the tetravalent metal phosphate-based antimicrobial agent and inorganic compound particles having a maximum particle size of equal to or less than 10 μm as recited in present claim 1. In addition, the maximum particle size of the zirconium phosphate antimicrobial agent and titanium dioxide used in the Examples of Koji are not determined. For at least this reason, Koji does not disclose all elements of the present claims and cannot be said to anticipate the present invention.

Additionally, there is no description in Koji that titanium dioxide used in Example 4 is anatase titanium oxide or rutile titanium oxide. Koji discloses that both anatase and rutile are preferable. On the other hand, since rutile titanium oxide has Mohs hardness of more than 6, rutile titanium oxide cannot be used in the present invention. For this additional reason, the present invention is not anticipated by Koji.

Additionally, the object of the present invention is different from that of Koji.

The object of the present invention is to solve the problem that an area of equipment that is in running contact with the molding is easily worn. The problem occurs only when a specific tetravalent metal phosphate-based antimicrobial agent is added to the resin.

The present inventor found that the above-mentioned problem could be solved by adding inorganic compound particles having a Mohs hardness of equal to or less than 6 to the composition, and by controlling the maximum particle size of the tetravalent metal phosphate-based antimicrobial agent and the inorganic compound.

As described in paragraph [0002] of US 2006/0182812 A1, Koji et al, (Koji, JP-A-7-304620) is cited as a prior art of this invention. The object of Koji is to obtain an antimicrobial agent composition hardly causing discoloration and deterioration.

In summary, there is no specific description concerning Mohs hardness of the inorganic compound particles and the maximum particle size of tetravalent metal phosphate-based antimicrobial particles and inorganic compound particles in Koji and the object of the present invention is different from that of Koji. Thus, Koji does not teach all elements of the present invention and there is no apparent reason for one of ordinary skill in the art to modify the disclosure of Koji with a reasonable expectation of success in achieving the present invention.

In view of the above, the present invention is neither anticipated, nor rendered obvious by Koji. Accordingly, Applicants respectfully request withdrawal of the rejection.

B. Hideki

Claims 1, 5, 6, 10, 11 and 15 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by JP 10-265314 ("Hideki").

Applicants respectfully traverse the rejection based on the following.

Technical difference between this invention and Hideki

First, Applicants submit that Hideki does not disclose, teach or suggest all elements of the present claims. Specifically, Hideki does not disclose the use of inorganic powder having Mohs hardness of 6 or less. For instance, Al_2O_3 having a Mohs hardness of about 9 is used as a fluidity improving powder in Sample No. 3 of Hideki. For at least this reason, Hideki does not anticipate the present invention.

The Examiner pointed out that Hideki discloses an example wherein the antimicrobial powder has a mean particle diameter of 0.9 μm or 1.3 μm, and the fluidity improving powder, calcium carbonate powder, had a mean particle diameter of 9.7 μm. However, Hideki does not describe the antimicrobial powder and the inorganic powder having a **maximum particle size** being substantially equal to or less than 10μm. In fact, there is a high probability that the calcium carbonate powder having a mean particle diameter of 9.7 μm has maximum particle size greater than 10 μm. For this additional reason, Hideki does not anticipate the present invention.

Additionally, the object of the present invention is different from that of Hideki.

The object of Hideki is to obtain an antimicrobial agent composition capable of readily passing through a sieve by including an antimicrobial powder comprising a specific metal and a specified metallic ion, and a fluidity improving powder in order to improve the powder fluidity of the antimicrobial powder therein (abstract and paragraph [0003]). In other words, the object of Hideki is to improve the fluidity of the antimicrobial powder. As cited above, the object of the present invention is to improve the processability and to suppress the wear of the equipment.

Hideki discloses the antimicrobial agent composition comprising a specific tetravalent metal phosphate-based antimicrobial agent and a fluidity improving powder. The examples of the fluidity improving powder include calcium carbonate, magnesium carbonate, amino acid-

based modifier, an alkaline earth metallic salt of a higher fatty acid (e.g., magnesium stearate, calcium stearate, magnesium oleate, calcium oleate), alumina, aluminum hydroxide, potassium aluminum sulfate, MgO, calcium phosphates (e.g., $Ca_3(PO_4)$, $CaHPO_4$, etc.) (described in paragraph [0012]).

However, in Hideki, the above-mentioned organic and inorganic powders are added in order to improve the fluidity. Hideki does not teach nor suggest the problem of abrasiveness.

In summary, Hideki does not disclose, teach nor suggest the antimicrobial composition comprising specific tetravalent metal phosphate-based antimicrobial particles and inorganic compound particles, both of which have maximum particle size of 10μm or less. Thus, Hideki does not teach all elements of the present invention and there is no apparent reason for one of ordinary skill in the art to modify the disclosure of Hideki with a reasonable expectation of success in achieving the claimed invention.

In view of the above, the present invention is not anticipated nor rendered obvious by Hideki.

Accordingly, Applicants respectfully request withdrawal of the rejection.

II. Response to Claim Rejections under 35 U.S.C. § 103

Claims 3, 8 and 13 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Koji in view of U. S. Patent No. 4,356,280 ("Wells").

Claims 2-4, 7-9 and 12-14 are rejected under 35 u103(a) as allegedly being unpatentable over Hideki in view of Wells.

Applicants respectfully traverse the rejection and submit that the cited references, whether taken alone or in combination, do not teach or suggest the present invention.

The present invention was carried out to solve the problem concerning the processability (abrasion of the equipment, etc), which may occur as a result of using the specific tetravalent metal phosphate-based antimicrobial agent.

Koji and Hideki are discussed above. The Examiner admits that Koji et al does not teach the size of the anatase titanium dioxide is smaller than the size of the phosphoric acid quadrivalent metal salt-based antimicrobial agent. The Examiner also admits that Hideki does not teach that the titanium dioxide is anatase titanium dioxide and that the mean particle size of the titanium dioxide is less than the mean particle size of the antimicrobial powder. To remedy these deficiencies, the Examiner relies on Wells.

The object of Wells (US Patent No. 4,356,280) is to provide a dispersion for incorporation with a synthetic fiber-forming polymer and an improved process for melt-spinning yam from a fiber-forming polymer (especially polyamide and polyester fibers).

The Examiner points out that Wells teaches that anatase titanium dioxide was the preferred form because it was softer than rutile and the preferred average diameter was 0.1 to 0.5 μm, most preferably 0.2 μm or less. In Wells, titanium oxide is used as an inorganic pigment, and is not used as an additive for suppressing the abrasiveness. It is well known that fiber-forming polymer compositions comprising hard additives give higher abrasiveness in yarn processing equipment.

Wells does not teach nor suggest that the abrasiveness caused by specific tetravalent metal phosphate can be suppressed by adding the inorganic compound particles having a specific Mohs hardness (e.g., anatase titanium dioxide).

In the present invention, although the antimicrobial composition comprises the specific tetravalent metal phosphate having high hardness, the abrasiveness can be suppressed by adding the specific inorganic powder having a designated Mohs hardness.

Since Wells does not disclose the composition comprising specific tetravalent metal phosphate and the composition comprising hard particles, one of ordinary skill in the art would not have been motivated to use anatase titanium dioxide having the particle size of 0.1 to 0.5 μm in order to improve the processability of a fiber or a film to which the antimicrobial composition is added. For at least this reason the present invention is patentable over the cited references.

Moreover, the effect of the present invention is unexpected from the disclosure of Koji, Hideki and Wells. In the present invention, by adding the specific inorganic particles and by controlling the maximum particle size, filter pressure increase, number of filament breakages, degree of wear of guide are suppressed without decreasing the anti-microbial activity (see Table 3 of the present invention). For this additional reasons the present invention is patentable over the cited references.

III. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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